

FUJI POWER MOSFET
Super FAP-G Series

N-CHANNEL SILICON POWER MOSFET

■ Features

High speed switching
Low on-resistance
No secondary breakdown
Low driving power
Avalanche-proof

■ Applications

Switching regulators
UPS (Uninterruptible Power Supply)
DC-DC converters

■ Maximum ratings and characteristic Absolute maximum ratings

(Tc=25°C unless otherwise specified)

Item	Symbol	Ratings	Unit
Drain-source voltage	V _{DS}	700	V
	V _{DSX} *5	700	V
Continuous drain current	I _D	±10	A
Pulsed drain current	I _D (puls)	±40	A
Gate-source voltage	V _{GS}	±30	V
Repetitive or non-repetitive	IAR *2	10	A
Maximum Avalanche Energy	EAS *1	242.2	mJ
Maximum Drain-Source dV/dt	dV _{DS} /dt *4	40	kV/μs
Peak Diode Recovery dV/dt	dV/dt *3	5	kV/μs
Max. power dissipation	P _D / T _a =25°C	2.16	W
	T _c =25°C	80	W
Operating and storage temperature range	T _g	+150	°C
Isolation Voltage	T ₃₀	-55 to +150	°C
	V _{iso} *6	2	kVrms

*1 L=4.45mH, V_{CC}=70V, T_{ch}=25°C, See to Avalanche Energy Graph *2 T_{ch}=150°C*3 I_F≤-I_D, -di/dt=50A/μs, V_{CC}≤BV_{DSS}, T_{ch}≤150°C *4 V_{DS}≤700V *5 V_{GS}=-30V *6 t=60sec, f=60Hz

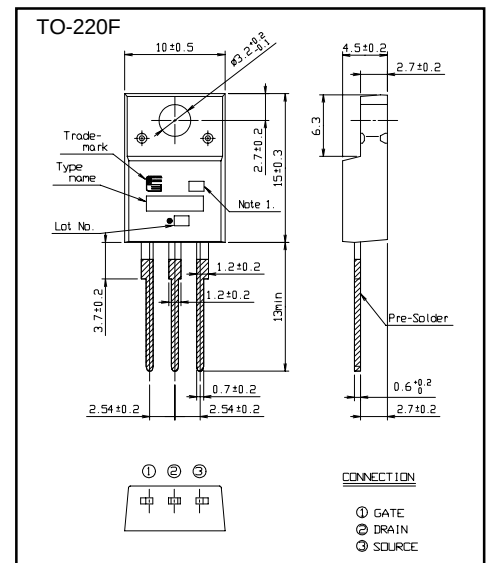
● Electrical characteristics (Tc=25°C unless otherwise specified)

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-source breakdown voltage	V(BR) _{DSS}	I _D =250μA V _{GS} =0V	700			V
Gate threshold voltage	V _{GS(th)}	I _D =250μA V _{DS} =V _{GS}	3.0		5.0	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =700V V _{GS} =0V T _{ch} =25°C			25	μA
		V _{DS} =560V V _{GS} =0V T _{ch} =125°C			250	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±30V V _{DS} =0V			100	nA
Drain-source on-state resistance	R _{DS(on)}	I _D =5A V _{GS} =10V		0.91	1.18	Ω
Forward transconductance	g _{fs}	I _D =5A V _{DS} =25V	5	9.5		S
Input capacitance	C _{iss}	V _{DS} =25V		900	1350	pF
Output capacitance	C _{oss}	V _{GS} =0V		140	210	pF
Reverse transfer capacitance	C _{rss}	f=1MHz		8	12	pF
Turn-on time t _{on}	td(on)	V _{CC} =300V I _D =5A		22	33	ns
	t _r	V _{GS} =10V		6	9	ns
	td(off)	R _{GS} =10Ω		40	60	ns
Turn-off time t _{off}	t _r			9	14	ns
	Q _G	V _{CC} =350V		25	37.5	nC
	Q _{GS}	I _D =10A		4	6	nC
Gate-Drain Charge	Q _{GD}	V _{GS} =10V		8.5	13	nC
Avalanche capability	I _{AV}	L=4.45mH T _{ch} =25°C	10			A
Diode forward on-voltage	V _{SD}	I _F =10A V _{GS} =0V T _{ch} =25°C		0.90	1.50	V
Reverse recovery time	t _{rr}	I _F =10A V _{GS} =0V		2.75		μs
Reverse recovery charge	Q _{rr}	-di/dt=100A/μs T _{ch} =25°C		14.0		μC

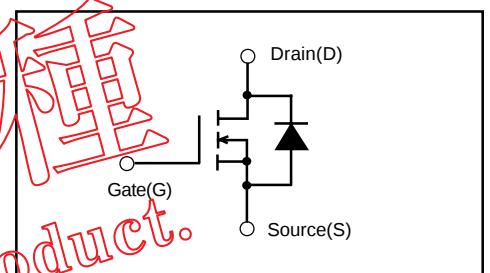
● Thermal characteristics

Item	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal resistance	R _{th(ch-c)}	channel to case			1.563	°C/W
	R _{th(ch-a)}	channel to ambient			58.0	°C/W

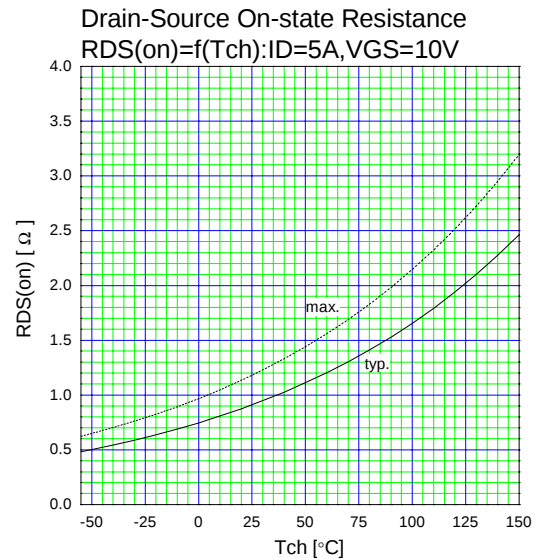
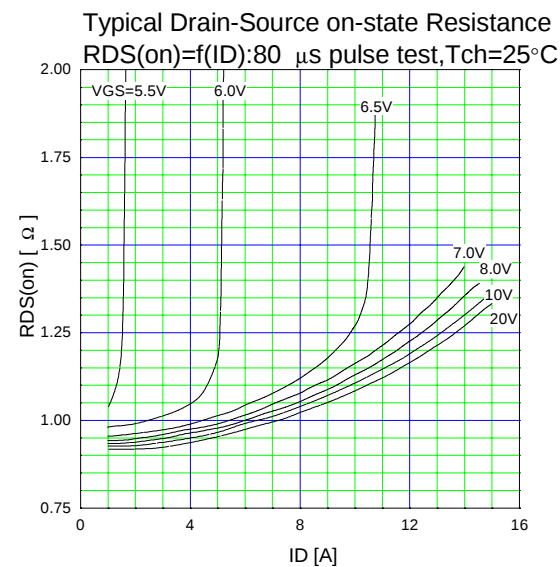
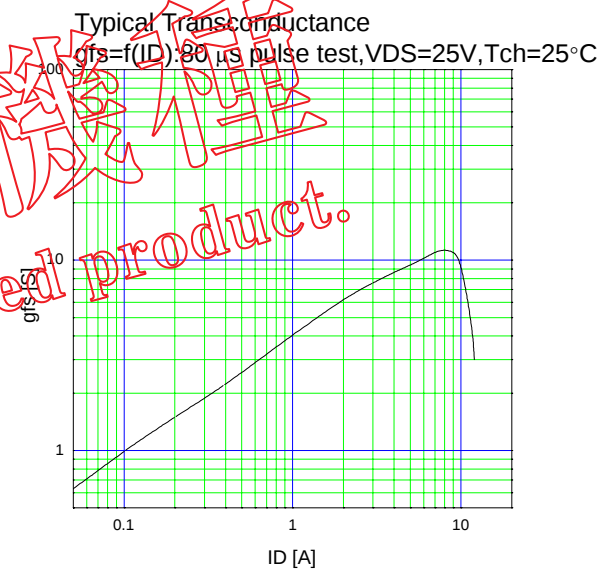
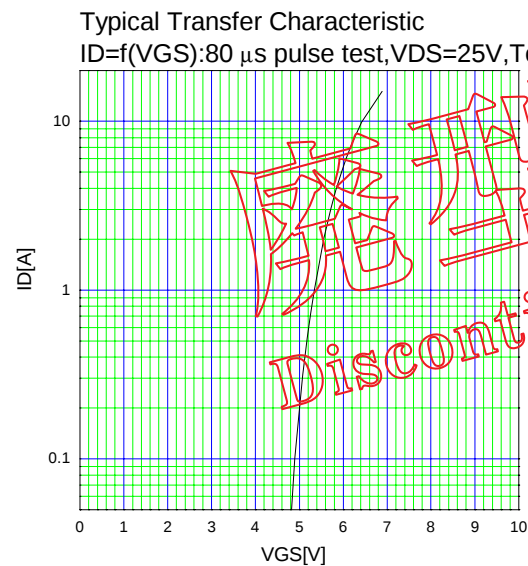
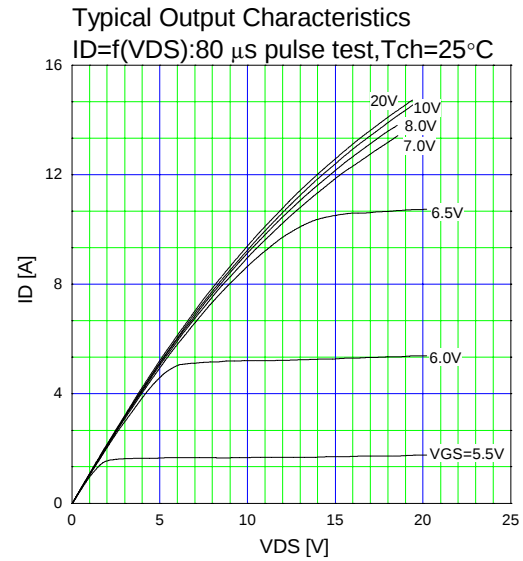
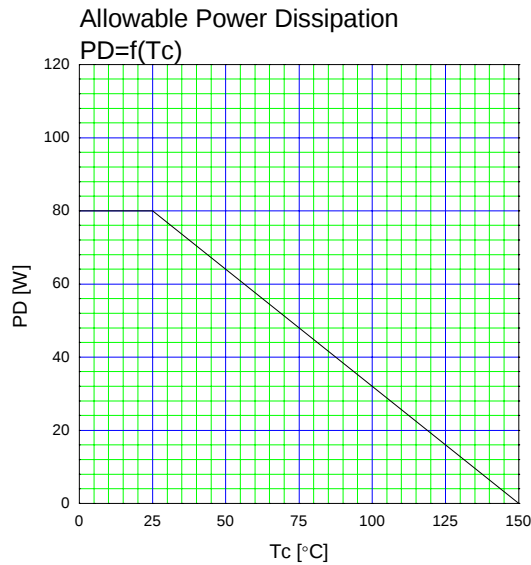
■ Outline Drawings [mm]

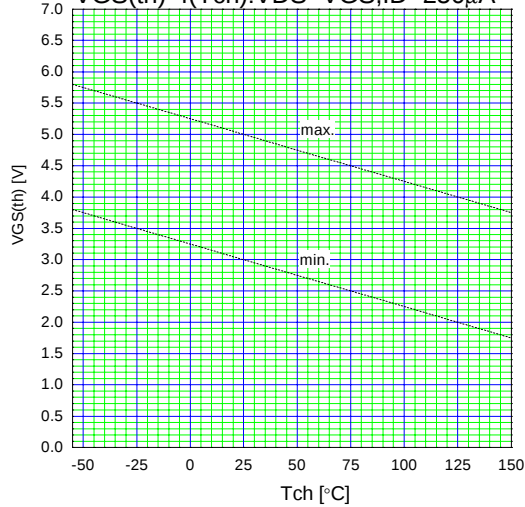


■ Equivalent circuit schematic

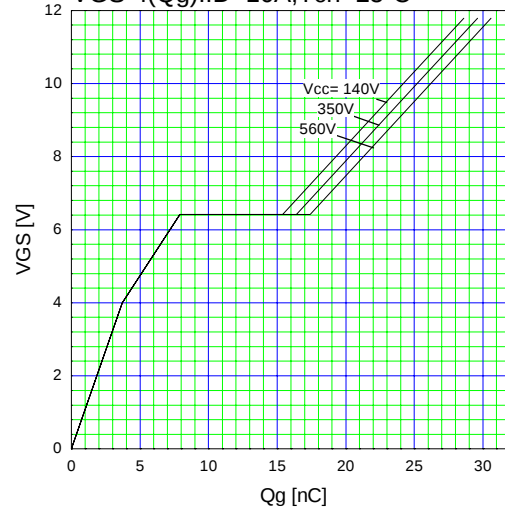


Characteristics

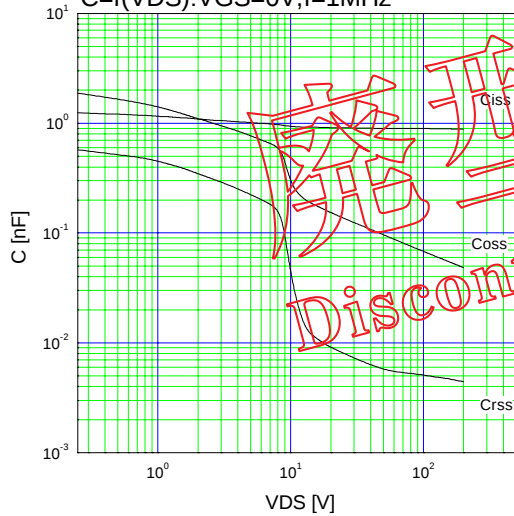


Gate Threshold Voltage vs. T_{ch} $V_{GS(th)} = f(T_{ch}): V_{DS} = V_{GS}, I_D = 250 \mu A$ 

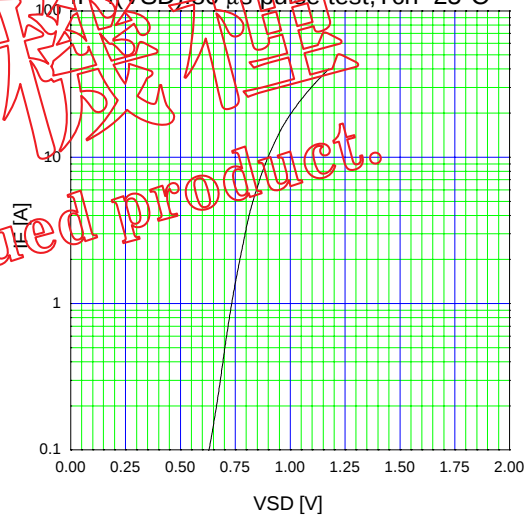
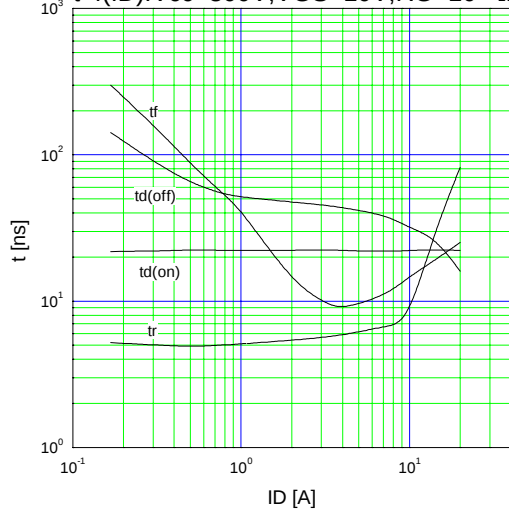
Typical Gate Charge Characteristics

 $V_{GS} = f(Q_g): I_D = 10A, T_{ch} = 25^\circ C$ 

Typical Capacitance

 $C = f(V_{DS}): V_{GS} = 0V, f = 1MHz$ 

Typical Forward Characteristics of Reverse Diode

 $I_F = f(V_{SD}): 30 \mu s \text{ pulse test}, T_{ch} = 25^\circ C$ Typical Switching Characteristics vs. I_D $t = f(I_D): V_{CC} = 300V, V_{GS} = 10V, R_G = 10 \Omega$ Maximum Avalanche Energy vs. starting T_{ch} $E_{(AS)} = f(\text{starting } T_{ch}): V_{CC} = 70V$ 